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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/032,370	12/21/2001	Jeffrey A. Trogolo	A-036	5277
7590	11/01/2004			
AGION TECHNOLOGIES 60 Audubon Road Wakefield, MA 01880			EXAMINER BERKO, RETFORD O	
			ART UNIT 1615	PAPER NUMBER

DATE MAILED: 11/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/032,370	Applicant(s) TROGOLO ET AL.	
	Examiner Relford Berko	Art Unit 1615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12/09/03.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22,33,34 and 45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22,33,34 and 45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>1/7/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Acknowledgement: The Amendment filed December 9, 2003 is acknowledged. The Supplemental Information Disclosure Statement filed January 7, 2004 is acknowledged, initialed and hereby attached to the Office Action.

Status of Claims

1. Claims 1-22 and claims 33, 34 and claim 45 are pending following applicant's amendment.
2. Claims 23-32, 35-44 and 46 are cancelled in view of applicant's amendment.

Rejections Withdrawn

1. The rejection of claims 1, 4, 5 and 18 under Sec. 112, second paragraph, as being indefinite for failing to point out and distinctly claim the subject matter which applicant regards as the invention is withdrawn in view of applicant's amendment.
2. The Statement of Statutory Basis for Claim Rejections under 35 U.S.C. Sec. 103 is as set out in the previous Office Action.

Claim Rejections-35 USC Sec. 103

Claims 1-18, 22, 33, 45 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Trogolo et al (US 6, 436, 422).

Applicants claim a high aspect ratio microcapsule comprising an antimicrobial agent coated with a hydrophilic polymer, said microcapsule having an aspect ratio of greater than about 2. Applicants define aspect ratio as the ratio of the longest dimension of a three-dimensioned particle to the shortest dimension. Generally, the high aspect ration antimicrobial microcapsules include microcapsules that are in the shape of flakes or sheets as well as those that are in the shape of fibers or cylinders. Other shapes, such as football and other oblong shapes are suitable as well. See instant specification page 5.

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Trogolo discloses an antibiotic coated substrate having an antibiotic coating composition coated thereon. The coating composition is formed of a hydrophilic polymer having antibiotic ceramic particles, preferably antibiotic zeolite dispersed therein. The antibiotic zeolite may further comprise a discoloration agent. See abstract. Antibiotic ceramic particles include zeolites, hydroxyapatite, zirconium phosphates and other ion-exchange ceramics. Any suitable hydrophilic polymer may be employed, including hydrophilic polyurethane. In antibiotic zeolite particles used in the preferred embodiment, ion-exchangeable ions present in zeolite, such as sodium ions, calcium ions, potassium ions and iron ions are partially replaced with ammonium and antibiotic metal ions. Such ions may co-exist in the antibiotic zeolite particle since they do not prevent the bactericidal effect. Examples of antibiotic metal ions include, ions of silver, copper, zinc, mercury tin, lead, bismuth, cadmium, chromium and thallium. Preferably, the antibiotic metal ions are silver, copper, or zinc ions, and most preferably silver is employed. These antibiotic metal ions may be incorporated into the zeolite by themselves or in a mixture. See col. 3 lines 21-65. A discoloration agent may be added to the antibiotic hydrophilic polymer. The inorganic discoloration inhibitor is an ion-exchanged ammonium ion in the antibiotic zeolite. The substrate may be any substrate to which the hydrophilic polymer adheres, including glass, plastic, metal, and woven and non-woven fabrics. An article comprising a substrate on which is coated with the antibiotic hydrophilic coating may also be used. The article may be a medical article, such as a catheter, stent, heart valve, or paper. See col. 5 lines 22-55. The solids in the coating solution preferably contain from about 0.01 to about 90% by weight of antibiotic zeolite and from about 10% to about 99.99% by weight of hydrophilic polymer. Trogolo is silent with regards to the aspect ratio, specifically an aspect ratio greater than about 2.

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While the reference is silent regarding the aspect ratio, difference in the aspect ratio will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such an aspect ratio is critical. Where the general conditions of the claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. Trogolo discloses the similar coated particles as desired by Applicants. Trogolo discloses sheets, fibers and cylinders (Figure 1 and col.5). Therefore, absent unexpected results, it is the position of the examiner it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the microcapsule to determine a suitable aspect ratio to achieve the desired results.

Claims 1-22, 33-34, 45 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Trogolo et al. (US 6, 436, 422) in view of Michal et al. (US 6287285).

Applicants claim a high aspect ratio microcapsule comprising an antimicrobial agent coated with a hydrophilic polymer, said microcapsule having an aspect ratio of greater than 'about 2. Applicants define aspect ratio as the ratio of the longest dimension of a three-dimensional particle to the shortest dimension. Generally, the high aspect ratio antimicrobial microcapsules include microcapsules that are in the shape of flakes or sheets as well as those that are in the shape of fibers or cylinders. Other shapes, such as football and other oblong shapes are suitable as well. See instant specification page 5.

Trogolo, as disclosed above, teaches an antibiotic coated substrate having an antibiotic coating composition coated thereon. Trogolo does not disclose the microcapsule comprise a dopant, specifically sodium nitrate.

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Michal discloses a method of providing a therapeutic, diagnostic or lubricious hydrophilic coating on and intra-coporeal medical device. See abstract. Additionally, nitric oxide donor drugs may be used as a vasodilator relaxing smooth muscles of a vessel prior to, during, and/or after angioplasty or stent placement. A variety of suitable nitric-oxide donor drugs include sodium nitrate. See col. 4.

Absent unexpected results, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modified the composition of Trogolo by adding a dopant-- specifically sodium nitrate as taught by Michal because of the expectation of relaxing smooth muscles of a vessel prior to, during, and/or after angioplasty or stent placement. Both Trogolo and Michal teach medical devices, speciGcally spents coated with a hydrophilic polymer. Therefore, it would have been obvious to add sodium nitrate to the composition of Trogolo for the added benefits taught by Michal. The expected result would be a microcapsule comprising a hydrophilic polymer, an antimicrobial agent and a dopant.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See PT0-892.

Response To Arguments

Applicant's arguments and remarks in the Amendment have been carefully considered but they are found unpersuasive:

Applicants argue that Trogolo et. al. do not teach, suggest, mention or infer microcapsules or micro-encapsulation or the preparation of antimicrobial, microcapsules as contemplated by the present invention; contending that the examiner has completely misconstrued the teachings and explicit wording of Trogolo et. al; that Trogolo et. al. disclose

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hydrophilic coatings comprising a hydrophilic polymer and an anti-microbial agent and the use thereof in the coatings of various substrates, including medical devices. Applicant further argues that the present invention is distinct from that disclosed in Trogolo in that the instant invention is directed to novel antimicrobial agents comprising a particulate hydrophilic polymer particles of high % aspect ratios having encapsulated therein certain antimicrobial agent especially silver zeolites.

In response to this argument, there is no distinction between the composition of Trogolo and the invention in the instant claims because Trogolo provides particles that are coated and the particles are dispersed in the hydrophilic polymer. Each one of the particles is individually coated, the coating composition comprises hydrophilic polymer having antibiotic ceramic particles dispersed therein and there are no aggregates and therefore no agglomeration (col 2, lin 55-65 and col 5, lin 30-35).

Applicant argues that because the selection of the specific form and aspect ratio in which the novel antimicrobial agent is used is predetermined by the application to which it is to be applied, that distinguishes the instant invention from the disclosure in Trogolo et al.

In response, though applicant discusses particle size and aspect ratio in the specification (spec at pages 4-5) no criticality of these physical parameters has been provided. Indeed, applicant points out that the manner of fabrication determines the desired aspect ratio (spec at page 5, lin 15-20); therefore absent criticality and unexpected results, the examiner in interpreting the claims in light of the specification (see page 5, lin 27-32) understands that the instant invention is similar to that of the prior art disclosure in that the prior art shows dispersion of particles without agglomeration.

Applicant argues that because Trogolo et. al. do not disclose the use of a dopant, particularly a sodium nitrite dopant, that assertion that it would be obvious to one of ordinary skill to modify the composition of Trogolo et al with a dopant, such as sodium nitrate, as taught by Mithal et. al. is inappropriate as nothing would suggest or infer that the nitric oxide agent would provide a benefit in enhancing the antimicrobial efficacy of the antimicrobial coatings.

In response, Trogolo et al provide an antibiotic coated substrate having an antibiotic coating composition coated thereon. According to Trogolo, in an embodiment of the invention, a relatively low degree of ion-exchange in the form of zeolites is employed to obtain superior bacteriocidal properties (col 4, lin 57-65), that zeolites embedded in the polymer is effective against bacteria on medical device surfaces (e.g. catheter—col 5, lin 55-65).

The invention disclosed by Michal provides method for providing therapeutic, diagnostic or lubricious hydrophilic coated devices and coatings for medical device applications (abstract) as well as microcapsules, microsponges (col 12, lin 10-55) and lubrications for intra-corporal medical devices (col 14, lin 1-10). It is highly desirable to coat the surfaces of intra-corporal medical devices with antibacterial coatings in order to meet the need to inhibit bacteria during surgical applications. Thus, it would have been prima facie obvious to one of ordinary skill to combine the invention in Trogolo with the disclosure in Michal et al in (coating the surfaces of medical devices with the composition in Trogolo) so as to meet the need for inhibiting bacteria during the use of intracorporal medical devices such as catheters, stents, etc.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Retford Berko** whose telephone number is 571-272-0590. The examiner can normally be reached on M-F from 8.00 am to 5.30 pm. Responsibility for future prosecution of this application has been assigned to Examiner Berko.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Thurman K Page**, can be reached on 571-272-0602. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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